



Figure 1
PRIOR ART

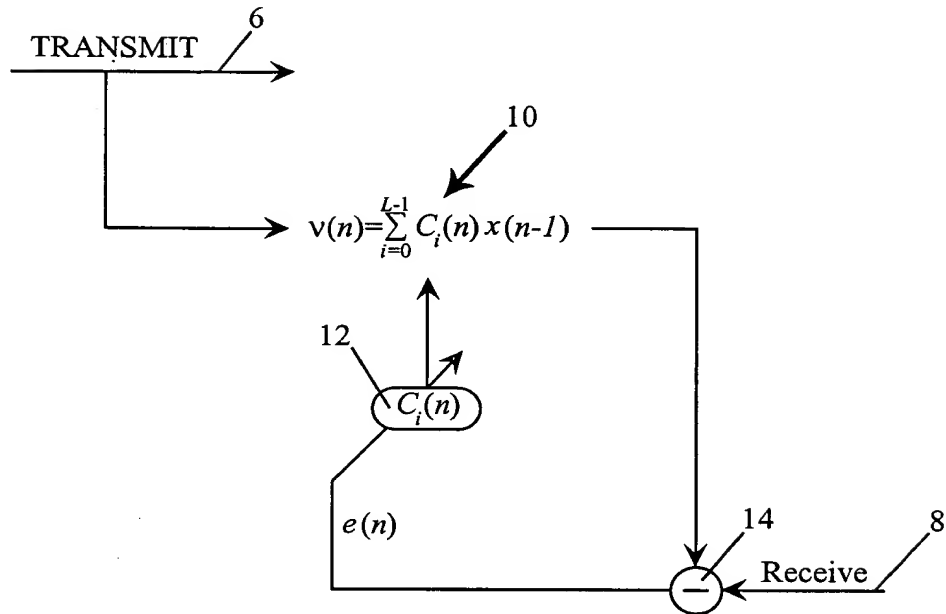
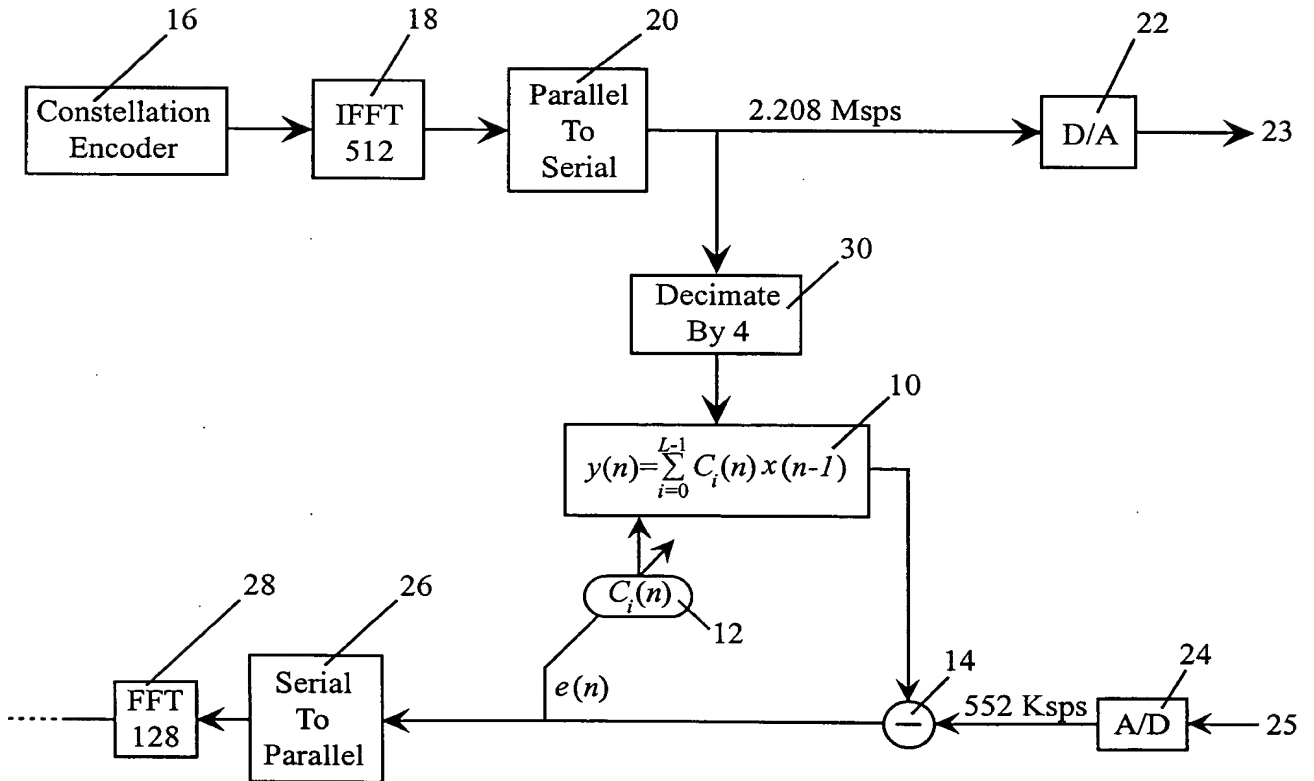
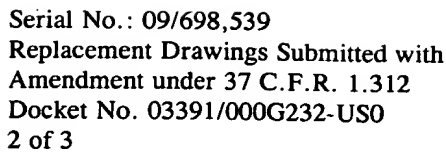


Figure 2
PRIOR ART





Block diagram of a digital echo canceller system. The system includes a Constellation Encoder (16), IFFT 512 (18), Parallel To Serial (20), D/A (22), Decimate By 4 (30), Echo-Canceller Coefficient Estimation (100), FFT 128 (28), Serial To Parallel (26), A/D (24), and a summing junction (14). The input signal $Z(k)$ is processed through the FFT 128 (28) and Serial To Parallel (26) blocks to produce $z(n)$. The output of the A/D (24) block is also $z(n)$. The signal $z(n)$ is fed into the Echo-Canceller Coefficient Estimation (100) block and the summing junction (14). The Echo-Canceller Coefficient Estimation (100) block outputs control signals (104) to the Constellation Encoder (16) and (102) to the FFT 128 (28). The Echo-Canceller Coefficient Estimation (100) block also outputs a signal C_i to a block calculating $y(n) = \sum_{i=0}^{L-1} C_i(n) x(n-1)$. The signal $x(n)$ is the output of the Decimate By 4 (30) block. The signal $y(n)$ is fed into the summing junction (14). The output of the summing junction (14) is fed into the A/D (24) block. The output of the A/D (24) block is fed into the Serial To Parallel (26) block. The output of the Serial To Parallel (26) block is fed into the FFT 128 (28) block. The output of the FFT 128 (28) block is fed into the Echo-Canceller Coefficient Estimation (100) block. The output of the Echo-Canceller Coefficient Estimation (100) block is fed into the Constellation Encoder (16). The output of the Constellation Encoder (16) is fed into the IFFT 512 (18) block. The output of the IFFT 512 (18) block is fed into the Parallel To Serial (20) block. The output of the Parallel To Serial (20) block is fed into the D/A (22) block. The output of the D/A (22) block is the final output signal 23.



Figure 5

